The interpersonal function of pain: Conserving multiple resources

Vervoort, T. [1], PhD* & Trost, Z.[2], PhD

1 Department of Experimental-Clinical and Health Psychology, Ghent University, Belgium

2 Department of Psychology, University of Alabama at Birmingham, United States

* Corresponding author: Tine Vervoort, Department of Experimental-Clinical and Health Psychology, Ghent University, Henri Dunantlaan 2, B- 9000 Ghent, Belgium. Tel: +32 (0)9 264 91 08 Fax: +32 (0)9 264 64 71. Electronic mail may be sent to Tine.Vervoort@Ugent.be

Category: Commentary

Number of pages: 8

Word count (references excluded): 998

Pain has an inherent capacity to instigate negative emotion (notably fear), grasp the attention of the pain sufferer, and motivate actions to reduce, avoid, or escape the painful stimulus [4]. In addition to the sufferer, behavioural manifestations of pain may demand the attention and concern of others in the social environment ("observers"), prompting them to various action [7]. Observer actions may stem from decisions to care for the sufferer (e.g., facilitate pain control) but also to escape or avoid personal threat [6,7]. Owing to their adaptive value, these pain-related dynamics likely have evolutionary origins and are highlighted within contemporary affective-motivational models of pain as natural responses to reduce suffer pain after acute injury and / or protect observers against potential personal harm [4,7]. However, when pain persists beyond ostensible healing and pain relief is considered unlikely – as in the case of chronic pain – these initially adaptive dynamics may become problematic. For instance, persistent attempts to control pain – either by pain sufferers or observers – can come at the expense of other important goals or daily function.

Findings informed by the above conceptualization have contributed to a dominant assumption that when pain becomes chronic it no longer serves adaptive functions and thus confounds evolutionary explanation. Why would we evolve to suffer chronic pain if it is not vital to one's own survival or that of another? In this issue of PAIN [13], Williams applies a contemporary evolutionary lens to behavioral adjustments of organisms in pain and proposes that *not only acute but also chronic pain* may function to prioritize energy and behaviour in ways that optimize adaptation to the demands of the physical and social environment. Drawing on animal models of chronic pain and the potential adaptive role of sensitization, Williams makes a convincing case that both acute and chronic pain may have evolutionary underpinnings with accompanying functional grounds. This alternate evolutionary account highlights that, at present,

we have a fairly limited understanding of the *function* of pain and that, particularly in the context of chronic pain, we might be inclined to construe (and assess) outcomes in terms of proximal and observable disadvantages rather than ultimate advantages or accrued resources. As noted by Williams, such resources may operate at multiple (e.g., neural, psychological, and behavioural) levels, and perhaps not at the least within the social domain.

Indeed, literature suggests that pain may have important effects on establishment and preservation of social/group bonds, which are likewise key to survival [7,12]. Formation of social resources may draw upon features associated with personal experience and expression of pain as well as responses to pain by others. For instance, both human and animal research suggests that prolonged suffering (as often accompanies chronic pain; [7]) is associated with increased likelihood of sufferer *appeasement* behaviour [3,8,10]; appeasement describes efforts to placate or pacify others in situations of potential or actual conflict. In this way, it is possible that expressions of vulnerability associated with pain may contribute to reduced social tensions and associated consolidation of social bonds. Furthermore, the behavioural expression of pain may, in and of itself, contribute to acquisition of social resources. Although there is evidence that (e.g., facial) pain expression might be essentially aversive to others [6,7], findings from emotion regulation literature suggest that *suppression* of negative emotions (such as those likely experienced in acute or chronic pain) actually hinders the consolidation of social bonds [1]. These findings tentatively suggest that, in addition to documented adverse effects, the expression of vulnerability -- being and showing we are in pain – may also function to facilitate 'relatedness' goals which comprise a key evolutionary resource.

Facilitation of social relatedness intrinsically depends on observer response to the person in pain, however, inquiry regarding how others' responses may contribute to goal attainment

(social or other) has only recently received interest in the pain literature. As noted, observers often approach the pain sufferer in efforts to help and/or control pain [7]. Although research suggests that, particularly in the context of chronic pain, these protective responses contribute to maladaptive outcomes (e.g., increased disability or fear in the pain sufferer), evidence is not unequivocal. Research also indicates that protective or pain-controlling responses (often referred to as 'solicitous responses' within operant frameworks) may in fact exert *a positive impact* on the pain sufferer [9]. Emerging inquiry seeks to reconcile these divergent findings by suggesting that the adaptive vs. maladaptive value of observer responses depends on the extent to which these are responsive to the needs or goals of the suffer. Particularly, the goal of immediate pain relief may be superseded by a variety of other goals, such as the desire to feel connected or relate to others. While often overlooked within pain research, relatedness has been highlighted in the broader psychology literature (e.g., Self Determination Theory; [2]) as a basic human motive. Fulfilled relatedness goals may subsequently empower the pain sufferer by facilitating or motivating more adaptive emotion regulation and coping behavior [2]. This notion coincides with literature on pain (in)validation [5] as well as recent findings that people are willing to forego immediate pleasure or happiness to maximize attainment of valued goals [11]. In the context of pain, it is thus plausible that eliciting others' sympathy/care and feeling related to others may ultimately be more important than immediate relief of pain.

Despite concerted research efforts, we have little understanding of the various needs of those in pain. This may be especially true in the context of persistent pain. Within the social realm, we have limited understanding of how observers attune to the proximal and overarching goals of persons in pain; nor do we fully understand the social dynamics that may subsequently facilitate/conserve evolutionarily-adaptive resources. With respect to her review, Williams

should be applauded for providing a thoughtful challenge to traditional conceptualizations of chronic pain as entirely dysfunctional from an evolutionary perspective; such conceptualizations are active across fields including psychology and the biological sciences. These fields are encouraged to entertain this challenge through empirical inquiry. Here, we expand on the potential interpersonal dimension of Williams' challenge, highlighting areas for further inquiry within research addressing interpersonal aspects of pain experience.

ACKNOWLEDGMENTS

There are no conflicts of interest to report.

REFERENCES

[1] Butler EA, Egloff B, Wilhelm FH, Smith NC, Erickson EA, Gross JJ. The social conseqeunces of expressive suppression. Emotion 2003;3:48-67.

[2] Deci EL, Ryan RM. The "what" and "why" of goal pursuits: human needs and the self-determination of behavior. Psychol Inq 2000;11:227-68.

[3] De Waal FBM, Ren R (1988). Comparison of the reconcilliation behavior of stumptail and rhesus macaques. Ethology, 78:129-42.

[4] Eccleston C, Crombez G. Pain demands attention: a cognitive-affective model of the interruptive function of pain. Psychol Bull 1999;125:356-66.

[5] Edmond SN, Keefe FJ. Validating pain communication: current state of the science. Pain 2015;215-219.

[6] Goubert L, Vervoort T, Crombez G. Pain demands attention from others: the approach/avoidance paradox. Pain 2009;143:5-6.

[7] Hadjistavropoulos T, Craig KD, Duck S, Cano A, Goubert L, Jackson PL, Mogil JS, Rainville R, Sullivan MJL, Williams ACdeC, Vervoort T, Fitzgerald TD. A biopsychosocial formulation of pain communication. Psychol Bull 2011;137:910-39.

[8] Keltner D, Young RC, Buswell BN. Appeasement in human emotion, social practice, and personality. Aggressive Behavior, 1997; 359-74.

[9] Newton-John TRO. Solicitousness and chronic pain: a critical review. Pain Reviews 2002;9:7-27.

[10] Price JS, Gardner R, Erickson M. Can depression, anxiety and somatization be understood as appeasement displays? J Affect Disord 2004;79:1-11.

[11] Tamir M, Ford BQ. Choosing to be afraid: preferences for fear as a function of goal pursuit.

Emotion 2009;4:488-497.

[12] Williams AC. (2002). Facial expression of pain: an evolutionary account. Behav Brain Sci 2002;25:439-88.

[13] Williams AC. (in press). What can evoluationary theory tell us about chronic pain? Pain.